Pergamon

Journal of Safety Research 35 (2004) 13–22

www.elsevier.com/locate/jsr

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The effects of ergonomics training on the knowledge, attitudes, and practices of teleworkers

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Received 18 February 2003; received in revised form 14 July 2003; accepted 28 July 2003

Abstract

Problem: The rapid growth of teleworking has raised several social and legal issues regarding an employer's responsibility for the safety of an employee's home office. In this paper, researchers discuss the need for safety training for teleworkers and the effectiveness of a home office ergonomics training program. **Method:** Study participants ($N = 50$) were randomly assigned into a treatment or control group. The treatment group completed the ergonomics training and a pre- and posttest. The control group completed the pre- and posttests without training. **Results:** The study demonstrated the need for teleworker ergonomics training. More than 85% of participants had not received teleworker training before, and 44% had experienced pain or discomfort while teleworking. Participants who completed the training significantly improved their scores on knowledge, attitude, and practices subtests. In a follow-up survey, participants indicated that they had made ergonomic changes to their offices based on the training. Several participants indicated that the pain or discomfort that they had been experiencing was eliminated or reduced as a result of the training.
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Keywords: Ergonomics; Training; Teleworkers

1. Introduction

1.1. The growth of teleworking

Teleworking, also known as telecommuting, means using information technology and telecommunications to replace work-related travel. With teleworking, employees work full- or part-time at home or at a local telework center. Communication is accomplished by phone, fax, modem, and teleconferencing.

Teleworking is changing the way millions of Americans communicate, commute, and work. Over the last several years, both private industry and the federal government have joined together to encourage these changes, many of which have proven to be beneficial to the economy, to the environment, and to families. In 2001, there were an estimated 28 million Americans who teleworked one day a week or more (Davis & Polonko, 2001).

The National Performance Review (Gore, 1993) and former President Clinton's Climate Change Action Plan (Clinton & Gore, 1993) identified teleworking as one method to help the U.S. achieve environmental goals, to conserve national resources, and to enhance the quality of work life. In his memorandum dated July 11, 1994, former President Clinton wrote, "The executive branch must implement flexible work arrangements to create a family-friendly workplace. The head of each executive department or agency is hereby directed to establish a program to encourage and support the expansion of flexible family-friendly work arrangements, including: job sharing; career part-time employment; alternative work schedules; and telecommuting and satellite work locations." In 1996, the President's Management Council approved the National Telecommuting Initiative Action Plan, launching a 3-year initiative to significantly increase the number of federal telecommuters (Lieber & Wohl, 1996). In December 1999, U.S. Representative Frank Wolf of Virginia announced details of a federal telework program that could dramatically increase the number of teleworkers nationwide. According to Representative Wolf, "the congestion and mobility crisis is perhaps the greatest single threat to continued prosperity and most

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doi:10.1016/j.jsr.2003.07.002

certainly our quality of life and the family unit. Telecommuting is the information age's answer to reducing traffic congestion, nurturing environmental stewardship, and strengthening the family" (International Telework Association and Council, 1999).

The rapid growth of teleworking has raised several social and legal issues regarding an employer's responsibility for an employee's home office. On November 15, 1999, the Occupational Safety and Health Administration (OSHA) sent a letter to a Texas employer stating that he was responsible for federal safety and health violations that occur in his employee's home office. The letter suggested that employers could be liable for any unfavorable incidents met by an employee who chose to work at home, such as unsafe stairs, improper lighting, and inadequate ventilation in home offices. This policy interpretation created a national uproar, causing some firms to cancel or postpone giving teleworking rights to their employees.

In January 2000, the U.S. Department of Labor withdrew the advisory letter and asked the National Economic Council to convene an interagency working group to examine the broad social and economic effects of teleworking. On February 25, 2000, OSHA issued a new compliance directive to formalize agency policy on home-based work. According to the new policy, OSHA will not inspect home offices for violations of federal safety and health rules and employers are not expected to conduct home office inspections. The only exception to this policy is for a home where factory-type manufacturing occurs.

The purpose of the Occupational Safety and Health Act of 1970 is to assure as far as possible every working man and woman in the nation safe and healthful working conditions. The question remains—who is responsible for the workplace safety and health of teleworkers in the virtual workplace? Many still believe the responsibility lies with the employer. "Taking the OSHA statement as a faithful interpretation of the rules, managers should demonstrate best efforts and thorough safety planning for all alternative workspaces, including home offices," says John Girard, an analyst with the Gartner Group in Stamford Connecticut (Zbar, 2000). Despite the Labor Department's retraction of the OSHA letter, Girard suspects OSHA will revisit the issue of home office safety within the next 5 years, as teleworking increases.

1.2. The risk of musculoskeletal disorders

Musculoskeletal disorders (MSDs) are injuries and disorders of the muscles, nerves, tendons, ligaments, joints, cartilage, and spinal disks. Examples of MSDs include carpal tunnel syndrome, tendonitis, sciatica, herniated disc and lower back pain. MSDs are one of the most significant problems in the workplace today. Work-related MSDs account for more than one-third of all occupational injuries and illnesses that are serious enough to result in days away from work. Each year more than 620,000 employees suffer lost-workday because of MSDs. These MSD injuries cost businesses $15 to $20 billion in workers' compensation costs each year. Indirect costs may run as high as $45 to $60 billion. Carpal tunnel syndrome, one form of MSD, results in more days away from work than any other workplace injury (OSHA, 1999).

According to a study by the International Telework Association and Council (Davis & Polonko, 2001), the primary home telework activity is using a computer (87%). The relationship between computer-use and the development of musculoskeletal disorders (MSDs) is well-documented (Bergqvist, Wolgast, Nilsson, & Voss, 1995a, 1995b; Demure et al., 2000; Faucett & Rempel, 1994; Ferreira, Conceicao, & Saldiva, 1997; Hales et al., 1994; Marcus & Gerr, 1996; Ong, 1994; Yu & Wong, 1996). The very technology that is powering the *Information Age* is also leaving many of its workers with this painful malady.

Workplace factors that increase the risk for computer-related MSDs include: improper workstation design; incorrect monitor, mouse, and keyboard placement; poor posture; incorrect chair height; improper office lighting; and intense typing without resting periods (Aaras, Horgen, Bjorset, Ro, & Thoresen, 1998; Demure et al., 2000; Keir, Bach, & Rempel, 1999; McHugh & Schaller, 1997; Ong, 1994). In a corporate or government workplace, many of these risk factors are controlled. The company purchases and sets up the computer workstations. Corporate safety officers inspect for ergonomics hazards. Lighting is engineered and designed for office use. Rest periods are common, as other workers are nearby and interruptions are likely. However, in the home office these risk factors may not be so easily controlled. Studies have shown that teleworkers typically set up their own offices without assistance (Center for Office Technology, 1999). Teleworkers may place their computers on coffee tables or old desks, creating numerous ergonomic hazards. Without training, teleworkers are unaware of workplace factors that increase their risk of developing MSDs.

A poll of the nation's leading technology and business executives in February 2000 found that only 9% of respondents had set safety guidelines for employees who work at home, with 80% having no guidelines and 11% unsure if their companies had set guidelines (Chief Information Officer, 2000). "This is a critical issue to everyone who works from home," says Debra A. Dinnocenzo, President of the teleworking consultant firm AlLearnatives. "Utilizing basic home office safety guidelines can prevent injury, productivity losses, and property damage, all of which have significant payoff to the individual home office worker, whether or not OSHA mandates it" (Zbar, 2000).

Research has shown that ergonomics training and environmental intervention decrease the incidence of musculoskeletal disorders. Businesses that have implemented

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